DOCUMENT RESUME

ED 195 308 JC 800 632

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TITLE Maximizing Teaching/Learning. Implementing Competency Based Education in Community Colleges, 10.
INSTITUTION Virginia Polytechnic Inst. and State Univ., Blacksburg.
SPONS AGENCY Michigan State Dept. of Education, Lansing. Higher Education Management Services.
PUB DATE [80]
NOTE 17p.; For related documents, see JC 800 623-631.

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Audiotape Recordings; Chalkboards; Community Colleges; *Competency Based Education; Demonstrations (Educational); Discussion (Teaching Technique); *Educational Media; *Learning Activities; Lecture Method; *Media Selection; Slides; Teacher Effectiveness; *Teaching Methods; *Teaching Styles; Transparencies; Two Year Colleges
IDENTIFIERS Socratic Method

ABSTRACT

As part of a series dealing with competency-based education, this monograph explores the optimum selection and utilization of instructional activities, materials, and methods. The monograph first discusses the responsibility of the instructor to plan learning activities that reinforce targeted performance competencies, and then presents a graphical evaluation of 34 learning activities in terms of the preparation, execution, and follow-up time each of them requires. The selection of audio-visual support materials for these activities is then facilitated by an outline detailing the relative ease of preparation, use, and storage of overhead transparencies, audio tapes, color slides, graphics, videotapes, and cutaways. Appropriate utilization of chalkboards and audio-visual software is then discussed. An examination follows of questions to be considered in evaluating the appropriateness of the lecture, demonstration, and discussion methods to course content, class size, and time constraints. The monograph concludes with an examination of two common teaching styles: (1) the problem-solving approach, in which the instructor sets goals, identifies appropriate learning activities, and evaluates student performance; and (2) the Socratic approach, in which the instructor, rather than providing information, draws answers from students through carefully sequenced questions. A list of works for further reading is appended. (JP)

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# MAXIMIZING TEACHING/ LEARNING

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This series of monographs includes the following:

1. Using Performance Goals
2. Using Performance Objectives
3. Developing a Performance Syllabus
4. Evaluating Performances
5. Motivating Performance Learning
6. Developing and Using Performance Modules
7. Addressing Affective Performance
8. Remediating and Enriching Performance Learning
9. Managing a Performance On The Job
10. Maximizing Teaching/Learning

This is one of ten monographs in a series relating to IMPLEMENTING COMPETENCY BASED EDUCATION IN COMMUNITY COLLEGES developed at Virginia Polytechnic Institute and State University. This project was developed under a grant to St. Clair County Community College and was funded by the Michigan Department of Education, Higher Education Management Services, Occupational Education Unit. Project #33B9-7447-2.

# Maximizing Teaching/Learning

This is Scene I and it is Thursday, time for the second class of the day. Students slowly walk into the classroom. Many say nothing. Some talk to each other. Conversations center around other classes, dating, and the coming weekend. Students do not appear interested in getting underway. No one has opened a note book. The students linger near the door, and none are at their station at the appointed hour. No completed work is evident, and a syllabus is not visible.

This is Scene II and it is Thursday, time for the second class of the day. Students quickly enter the classroom. Conversations cover a number of topics. Many of the students are talking about the student debate planned for today. Others are discussing due projects. The students appear eager to begin the class. Those at their stations are opening notebooks and cross checking with the syllabus.

The instructors in Scenes I and II have many background characteristics in common. Both have advanced degrees and instruct in the same subject matter area. Both have instructed for ten years. Both use a competency based system!

Scene I is too often a rerun across the country. Students, administrators, colleagues, politicians, and taxpayers are concerned. All are asking, "Why?" We should all be demanding the answer and immediate corrective action. Occupational education instructors must seek to maximize teaching/learning.

## Context

This monograph series includes ten separate documents related to implementing competency based education. Each monograph addresses an important aspect of implementation. Generally speaking, the monographs may be arranged into three groups: (a) planning instruction, (b) providing instruction, and (c) evaluating instruction.

Performance goals, performance objectives, and a performance syllabus all attempt to make public what is to be done in the program, course, or unit of instruction. Making information public about what is going to occur communicates directly to students. Three monographs in this series are devoted to using these communication devices in planning.

The monographs on motivating performance learning, developing

performance modules, and developing affective learning/teaching all relate to providing instruction. Students need to be motivated in order to learn. Modules have proven to be a successful way to organize and present bite-size content for the delivery of instruction. The monograph on affective performance utilizes all of the common factors of the instructional process. It provides clues to preventing CBE from being mechanistic.

The evaluation of instruction is addressed by the monographs on evaluating performances, managing performance on the job, and managing performance remediation. The actual evaluation of performance has been a crucial but difficult part of competency based education. Actual performance on the job is the ultimate test of practicality and useability of what has been taught. The remediation monograph provides recycle options. These monographs serve as checks to insure that the intended products of learning/teaching have been realized.

Nine monographs in three groups. Great! What more could be asked? Well, it happens that CBE is a system for designing and packaging learning/teaching. By and large, care has been exercised not to prescribe how the instructor should instruct. This is good. Yet, the absence of information on this topic has led to a host of myths, considerable frustration, and much confusion. Thus, this monograph is intended to address the general notion of how to instruct. However, before going further, be advised that how to instruct is a matter of choice! It is an individual instructor's choice! There is no one right way. This monograph, at best, will prompt you to consider the many alternatives that are available.

The remainder of this monograph is designed to present alternatives. The sections are ordered from specific to general. You will find very little prescription and very brief descriptions. The sections include (a) learning activities, (b) audio-visual support, (c) methods, and (d) teaching/learning approaches.

## Learning Activities

Learning activities are those things the student does which introduce, support, refute, and apply new knowledges, skills, and attitudes. Carefully planned learning activities are the core of teaching/learning. Insofar as possible, the learning activities should closely resemble real life. The responsibility for facilitation of learning activities rests with the instructor. The responsibility for learning rests with the student.

Learning activities should be derived from a careful analysis of the tasks a student will be expected to master. Thus, the tasks become the foundation from which to facilitate learning activities. As noted in other monographs in this series, a task is but one of many competencies describing an essential knowledge, skill, or attitude required to meet a terminal performance objective. The task is often presented as the performance element in an enabling performance objective. The tasks can be the process for developing the product.

Decisions regarding the appropriate learning activities should be made within the parameters set by four questions: (a) Under what condition is the student expected to do the task? (b) What must the student know and be able to do to exhibit competence? (c) How well does the student need to be able to do the task? And (d) How quickly does the student need to be able to do the task?

The following account of learning activities is designed as a learning activity bank. It does not represent a corner on the market. Draw upon the list, consistent with the above definition, admonishments, and parameters. It is doubtful that you could ever overdraw. However, feel free to make your own deposits to the account. The only error made by previous account holders was to overuse one entry to the exclusion of other entries. Balance will insure an optimal net worth. As time is a wise investment, the account is codified by: (a) preparation time, (b) execution time, and (c) follow-up time for the instructor. Here's to your good fortune!

**Learning Activity Bank**

Code

| | |
|---|---|
| 20 minutes or less | = L = little |
| 21 minutes to 3 hours | = S = significant |
| 3 hours or greater | = G = great |
| inconsistent time | = V = varies |
| should be purchased | = D = don't |

| Learning Activity | Preparation Time | Execution Time | Follow-up Time |
|---|---|---|---|
| Handout | G | L | L |
| Review | L | L | L |
| Idea Incubation | L | L | L |
| Programmed Instruction | D | V | L |
| Supervised Study | L | V | S |
| Information Handout | S | L | L |

| Learning Activity | Preparation Time | Execution Time | Follow-up Time |
|---|---|---|---|
| Role Play | S | S | L |
| Brainstorming | L | L | L |
| Panel Discussion (student) | L | S | L |
| Buzz Groups | L | L | L |
| Project | S | L | S |
| Peer Tutoring | L | L | L |
| Research Paper | S | L | S |
| Module | V | V | L |
| Practice | L | V | S |
| Test | S | V | S |
| Student Presentation | L | L | L |
| Field Trip | S | V | L |
| On-job-training | S | V | S |
| Game | V | V | V |
| Worksheet | L | V | L |
| Simulated Experience | G | V | S |
| Show and Tell | L | L | L |
| Taste and Tell | L | L | L |
| Hear and Tell | L | L | L |
| Smell and Tell | L | L | L |
| Feel and Tell | L | L | L |
| Conference | L | V | L |
| Guest Speaker | L | S | L |
| Interview by Student | L | S | L |
| Panel Discussion (outside) | S | S | L |
| Reading Assignment | L | L | S |
| Film (assigned) | D | L | L |
| Film Strip (assigned) | D | L | L |

## Audio Visual Support AVS

Learning activities can be embellished with audio-visual support. Indeed, the student interaction with an audio-visual support becomes a learning activity. The learning activities presented earlier were chosen because of their independence from the instructor when in use by the student, relative low cost, and lack of dependence on a facility/equipment. Most audio-visual support requires a higher level of dependence on the instructor, money, and facility/equipment. Nevertheless, AV's can make the difference. The following sections

are intended to facilitate decision making as it relates to choosing alternatives.

**Characteristics**

The following outline should assist you in considering the more common AV's. It does not provide a complete list.

1. Overhead transparencies
   a. available in color or black and white
   b. easy to make
   c. applicable to small or medium-size groups
   d. appropriate for short presentations
   e. easily stored
   f. adaptable with overlays
   g. adaptable with writing
2. Audio tapes
   a. easy to make
   b. easy to revise
   c. reusable
   d. applicable to any size group
   e. appropriate for short presentations
   f. easy to store
   g. alternative for reading
3. Color slides
   a. moderately difficult to prepare
   b. easily revised
   c. applicable to any size group
   d. appropriate for short presentations
   e. easily stored
   f. complement other media
   g. valuable in self-instruction programs
4. Graphics
   a. color or black and white
   b. difficult to prepare
   c. difficult to revise
   d. appropriate for small-size group
   e. appropriate for short presentations
   f. difficult to store
   g. difficult to manipulate
5. Videotapes
   a. color or black and white
   b. difficult to make

c. appropriate for small size group
d. appropriate for short or long presentations
e. equipment dependent
f. substitute for reading
g. immediate reinforcers

6. Cutaways
   a. real-life simulators
   b. movable
   c. difficult to make
   d. difficult to store
   e. appropriate for small size groups
   f. appropriate for displaying relationships
   g. excellent attention getter

**Chalkboards**

The chalkboard is not an audio visual itself but can be transformed into one with the use of chalk. Below are a brief list of things that can be done with the chalkboard. It is probably appropriate to use the chalkboard for three or four different things each day. It is so easy, convenient, well received, and inexpensive!

1. Present new terms and definitions
2. Sketch parts and devices
3. Communicate assignments
4. Outline the day's activities
5. Relay safety messages
6. Present test items
7. Accept student feedback
8. Diagram processes
9. Supplement overlays
10. Replace instructor verbage

**Audio Visuals Software**

The development of software (consumable devices) has continued with an astounding pace during the past five years. All kinds of art "cheaters" are now available. Even the most inept can develop professional appearing charts, overlays, graphics, etc.. The materials include such things as transfer lettering, numbers, symbols, and borders; adhesive screens, textures, colors, and cartoon characters; pattern tapes; projectable transfer letters; matching color felt-tip pens; wax pencils; and many more. A visit to the local art/craft supply store might be interesting. In addition, most every library will have

a reference book detailing what is available from whom. An example reference is **Audio Visual Marketplace.** Just ask your librarian. Also see the Annotated Outreach section of this monograph.

### Methods

Methods is an overused and misunderstood term. Books have been written about it. Most undergraduate and graduate teacher training programs require a course in it. For the purpose of this monograph, **methods** is a classification of teaching activities more general than learning activities with audio visual support but less general than an approach. Thus, all of the learning activities and audio-visual supports are subsumed under the heading of methods.

Methods can be represented on a three-part continuum including (a) lecture, (b) demonstration, and (c) discussion. Each of the parts is distinctive and useful. None is better than the others. The key considerations are represented by teacher-centered or student-centered concerns. The particular content, size of class, and time should be considered in selecting the appropriate method.

#### Lecture

The purpose of a lecture is to transmit information to a large group in a short period of time. Lectures require a great deal of preparation time and need to be supported by various audio-visuals. The lecture is a great opportunity for the instructors to feed their egos! We particularly like to lecture. It is teacher centered. Handouts, programmed instruction, information handouts, modules, student presentations, guest speakers, films, film strips and reading assignments are adaptations of lectures.

The following questions should assist you in determining the appropriateness of a lecture.

1. What knowledge, skill, or attitude needs to be learned?
2. How many students need the content?
3. Do all or most of your students need the content now?
4. How much preparation time is available?
5. Are you in command of your nonverbal cues?
6. Can you develop interest in the lecture?
7. Are there appropriate audio-visual support systems?
8. Would a handout work just as well?
9. Can you devise means to insure that more than one sense is used by students?
10. Are there natural divisions which equate to twenty minutes

or less?

11. Would a video tape work just as well?
12. Do your impromptu lectures last five minutes or less?
13. Could you provide an outline of important parts of the lecture?
14. What proportion of your teaching time do you spend lecturing?
15. Would a text assignment work just as well?
16. Do you summarize regularly in the lecture?
17. Do you pose questions in your lectures?
18. Have you ever listened to and watched one of your own lectures?

**Demonstration**

The purpose of the demonstration is to transmit the big picture to a relatively small group of students in a short period of time. Demonstrations usually require a lot of preparation time and must be supported with various audio-visuals. Demonstrations are particularly useful in teaching skills and are more teacher centered than student centered. There are several variations of demonstrations. Projects, peer tutoring, research papers, practice, field trips, on-the-job training, simulated experiences, and video tapes are adaptations of demonstrations. The following questions should assist you in determining the appropriateness of a demonstration.

1. Does the learner need to see the process?
2. How many students need the content?
3. How many students need the content now?
4. How much preparation time is available?
5. Can you tell and show the content?
6. Can you appeal to other senses?
7. Do you want the students to imitate you?
8. Is there A-V support available?
9. Will the demonstration last more than twenty minutes?
10. Could you use a video tape just as well?
11. Can you ask questions during the demonstration?
12. Can the students take notes?
13. Will there be practice time for the students?
14. Can the students easily identify the steps?
15. Will you permit the students to ask questions?
16. Is there only one right way?
17. Will you support the demonstration with handouts?

18. Have you ever listened to and watched one of your own demonstrations?

**Discussion**

The purpose of the discussion is to solicit and involve the student in content transmittal. Discussions are limited to small groups and require considerable time. The discussion method does not require much audio-visual support. This method is particularly useful in the cognitive and affective areas. It promotes understanding and clarification of concepts, ideas, and feelings. There are numerous variations, and the discussion method can vary from teacher centered to student centered. Role playing, debate, panel discussion, reviews, supervised study, brainstorming, buzz groups, idea incubation, tests, sense and tell, worksheets, conferences, and interviews are examples. The following questions should assist you in determining the appropriateness of a discussion.

1. Do you need active involvement from the student?
2. How many students need to be involved?
3. Must you hear everything being said?
4. How much time is available?
5. Is divergent thinking a desirable end?
6. Could you just as well tell them?
7. Can there be more than one right answer?
8. Is there time to clarify differences?
9. How much control do you need?
10. Can you accept the students' views?
11. Can interest be aroused and maintained?
12. Is there time to draw conclusions?
13. Is there time to follow-up?
14. What needs to be tested?
15. Is two-way communication necessary?
16. Are checks and balances available to prevent certain students from dominating?
17. Are there means to keep on the topic?
18. Have you ever listened to and watched yourself in a discussion?

## Teaching/Learning Approach

The teaching/learning approach is an instructor's portfolio of knowledges, skills, and attitudes toward teaching and learning. It is highly personal and is mirrored by the specific actions of the instruc-

tor. The teaching/learning approach can be modified with new or alternative learning experiences. It is manifested through a practical application of learning activities, audio-visual support, methods, principles of learning, and theories of learning. This monograph will not contrast or even list principles or theories but will present a rather detailed description of two approaches. The first is commonly referred to as problem solving. The record is referred to as Socratic. Semantic debate is possible regarding these labels. Nevertheless, the descriptions are not intended as prescriptions for you. You should feel free to revise your own portfolio. These approaches are very compatible with competency based education.

**Problem Solving Approach**

The problem solving approach appears to be public domain. John Dewey, Alfred Krebs, Terry Student, Tracy Teacher, and the scientific community have all contributed. The following description is an empirical compilation of the process.

1. Select instruction topic
   a. Will usually be a performance objective in CBE.
   b. Can be made explicit by adding "ing" to action verb in performance element of performance objective. Example: "make a bed" becomes "making a bed."
   c. Solicit suggestions from students to involve them.
2. Conduct interest approach
   a. Appeal to their needs.
   b. Find out what they already know.
   c. See monograph in this series on "Motivating Performance."
3. Set learner goals
   a. Seek to get students to "buy in."
   b. Permit students to commit to a goal.
   c. See monographs in this series related to goals, performance objectives, motivation, and remediation.
4. Identify learning activities
   a. Use methods to teach.
   b. Facilitate learning activities.
   c. Embellish with A-V.
   d. Encourage student suggestions for learning.
5. Evaluate performance
   a. Test for what has been learned.
   b. Test for what has been taught.

c. Move on to new performance or recycle.
d. See monographs in this series related to evaluation and remediation.

The problem-solving approach has also been presented in the format of Job Instructional Training (JIT). This description evolved from a military training program as a concise system for planning and instructing for skill development. JIT also appears to be public domain. The procedural steps follow.

1. Prepare for instruction
   a. present a time table
   b. perform skill yourself and list steps
   c. perform skill again and pick key points
   d. set up the demonstration area
2. Prepare the learner
   a. put learner at ease
   b. find out what learner already knows
   c. interest the learner
   d. place learner for optimal learning
3. Present the skill
   a. tell, show, and illustrate skill
   b. repeat skill demonstration
   c. accept questions and respond
4. Facilitate practice
   a. request a return demonstration
   b. critique performance
   c. require practice
5. Follow-up
   a. check learner frequently
   b. taper off supervision
   c. validate competence

Another expression of the problem-solving approach is to address five simple questions concurrently. These questions have been used and refined to apply to almost every situation. They are our favorites.

1. Where are we now?
2. Where are we going?
3. Why are we going?
4. How are we going to get there?
5. How do we know when we are there?

**Socratic Approach (Questioning)**

This approach evolved from what Plato said was Socrates' method. It is a way of teaching in which the instructor gives no new information but draws answers from the student through carefully planned and sequenced questions. The expansion of all forms of questions has been labeled an approach. Like problem solving, this approach appears to be public domain.

The questioning approach is student centered but can provide many benefits for the instructor. It can make students think. It can assist instructors in obtaining feedback. It can keep students awake. And, it can slow down an instructor who tends to go too fast.

There is a definite difference between the effective and ineffective use of questioning. How do you generally ask your students questions? Do you state the student's name first, as in "Alice, what are five types of adverising?" Or do you ask the question first, as in "What are five types of advertising, Alice?" When you state the student's name first, all of the other students tend to relax and watch the spotlight turn to Alice. When you ask the question first, none of the students know where the spotlight will fall.

There is also a difference between the types of questions that can be used. Some questions simply cause students to react, much the same way the driver of a car does when a child runs in front of the car. Examples of reacting questions are: What color is this wall? Who is President of the United States? What year is this? What is 10 squared? Other questions cause students to think and justify their thought. Examples of thinking questions are: Why is the wall green? Who do you think will be the next president? If there is another world war, when do you think it will occur? How would you explain the concept of square root?

The 5 **w's** and an **h** are helpful cues to keep in mind. The 5 **w's** are **who, what, when, where** and **why.** The **h** is **how.** Entire lessons can be built around these six words and the questions they can ask.

Questioning is the catalyst that enhances almost any teaching situation. The more questions asked, especially thinking questions, the more efficiently students will learn. Instructors should keep questions in mind as a valuable tool to complement all learning activities. There are three questions that can always pull an instructor to safety. They can be used almost anytime and are especially useful in situations in which direction has been lost. The questions are: Where are we now? Why is it important that we **(insert the topic of instruction)**?

And, what do we need to know or to be able to do **(insert the topic of instruction)**? We suggest that you commit these questions to memory. Learn them better than your name. You can't overuse any of the three!

### Annotated Outreach

The literature is filled with support information related to teaching and learning. The following entries are provided as current representative publications. Each should provide you with some contemporary help.

Bagford, Laurence W. Jones, Anthony S., and Wallen, Edward. **Strategies in Education Explained.** Urbana, Ohio: Karlyn Publishing, 1976.

This book emphasizes teaching strategies for teachers from the kindergarten level to the college level. The content is organized around strategies for individuals, for small groups, for large groups, and for special use.

Each strategy is analyzed by the same format. This consists of definition and description, advantages or special purposes, disadvantages or limitations, guidelines for maximum utilization, and a summary.

The authors define the term **strategy** as an educational method for turning knowledge into learning. They have a very practical approach for presenting 27 different teaching strategies.

Barnes, James (Ed.). **Audio-Visual Marketplace.** New York: Bowker Publishing Company, 1979.

This document was referred to in the body of the monograph. It is a reference publication describing all the products and sources for A-V materials. It is a great "home shopper" and a must for your school's library. Be sure it is there.

Combs, A.W.. **Myths in Education.** Boston: Allyn and Bacon, Inc., 1979.

A great "picker upper." This paperback provides a dimension we've all felt. The book is well organized and is thereby a useful reference. It is thought provoking and is sure to be the talk of coffee rooms. Be ready for the fun.

Hoover, Kenneth H., **The Professional Teacher's Handbook.** Boston: Allyn and Bacon, Inc., 1976.

The 30 chapters in this book emphasize the basics of classroom instruction. It is intended primarily for pre-service and early inservice teacher preparation. However, the material can be very useful to all

teachers.

The first unit, "Preinstructional Activities," emphasizes preparation for actual instruction. This unit contains chapters on Gaining the Concept, Establishing Instructional Objectives, and Planning for Teaching.

The second unit emphasizes methods that focus on the individual. A total of 12 chapters emphasizes a wide variety of individually oriented teaching methods. Examples of methods covered are: questioning strategies, the case method, independent and semi-independent study, etc..

The third unit covers methods that focus on the group. The ten chapters in this unit range from discussion methods to lecture, to review method, to evaluation methods.

**Sign Off**

This monograph was designed to highlight alternatives. Hopefully, it will prompt you to try different things in different ways. Performance teaching and learning is and will continue to be a personal and individual art/science. No one should expect you to be like me or vice versa. However, no one should be rebuked for doing what is right and best.

The ultimate of performance teaching and learning is a nebulous thing called learning efficiency. At best every student is learning all that can be learned all of the time. If this were possible, we could give the class a learning efficiency factor of 100! But, alas, this has not yet been achieved. It will only be achieved when the performance instructor has chosen the best learning activities, audio-visual supports, methods and teaching/learning approach. This will maximize teaching/learning.

Well, folks, what's Scene III going to be? We're betting you'll do great. See you for your encore!

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